

What is claimed is:

- 5 1. A method for inhibiting thrombosis in a patient whose blood is subjected to extracorporeal blood circulation which comprises contacting or admixing with the extracorporeal circulating blood with a Factor IXa compound in an amount effective to inhibit thrombosis in the patient.
- 10 2. The method of claim 1, wherein the Factor IXa compound is an active site-blocked Factor IXa.
- 15 3. The method of claim 1, wherein the Factor IXa compound is Glu-Gly-Arg chloromethyl ketone-inactivated human factor IXa.
4. The method of claim 1, wherein the effective amount comprises from about 0.01 $\mu\text{g/ml}$ plasma to about 250 $\mu\text{g/ml}$ plasma.
- 20 5. The method of claim 1, wherein the effective amount comprises from about 0.05 $\mu\text{g/ml}$ plasma to about 25 $\mu\text{g/ml}$ plasma.
6. The method of claim 1, wherein the effective amount comprises from about 0.1 $\mu\text{g/ml}$ plasma to about 5 $\mu\text{g/ml}$ plasma.
- 25 7. The method of claim 1, wherein the patient is subjected to extracorporeal blood circulation during transplant surgery, abdominal surgery, vascular surgery or cardiopulmonary bypass surgery.
- 30 8. The method of claim 1, wherein the patient is a human being.
9. A pharmaceutical composition which comprises an effective amount of a Factor IXa compound and a pharmaceutically acceptable carrier.

10. The pharmaceutical composition of claim 9, wherein the carrier comprises a diluent.
- 5 11. The pharmaceutical composition of claim 9, wherein the carrier comprises an appropriate adjuvant, a herpes virus, a liposome, a microencapsule, a polymer encapsulated cell or a retroviral vector.
- 10 12. The pharmaceutical composition of claim 9, wherein the carrier is an aerosol, intravenous, oral or topical carrier.
- 15 13. An assay to monitor antithrombic activity of a Factor IXa compound infused into circulation of a patient which comprises:
- (a) obtaining Factor IXa-deficient plasma;
- (b) mixing the plasma from step (a) with diatomaceous earth and with plasma from the patient;
- 20 (c) incubating the mixture with a source of lipid and calcium chloride under conditions suitable for clot formation; and
- 25 (d) measuring time necessary for clot formation in the incubate, thereby monitoring the antithrombic activity of the Factor IXa compound infused into the circulation of the patient.
- 30 14. A method for evaluating the ability of an agent to inhibit an active site of a Factor IXa compound which comprises:
- (a) contacting the Factor IXa compound with the agent to form a protein complex;
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(b) incubating the protein complex under conditions suitable for clot formation;

(c) measuring time necessary for clot formation in the incubate, and

(d) comparing the time measured in step (c) with the time measured in the absence of the agent, thus evaluating the ability of the agent to inhibit the active site of the Factor IXa compound.

15. The method of claim 14, wherein the agent comprises a peptide, a peptidomimetic, a nucleic acid or a small molecule.

16. The method of claim 14, wherein the agent is an antibody or portion thereof.

17. The method of claim 16, wherein the antibody is a monoclonal antibody or a polyclonal antibody.

18. The method of claim 16, wherein the portion of the antibody comprises a Fab.

19. An agent obtained from the method of claim 14, which agent is capable of inhibiting the active site of Factor IX.

20. A method for inhibiting thrombosis in a patient whose blood is subjected to extracorporeal blood circulation which comprises contacting or admixing with the extracorporeal circulating blood with an agent capable of inhibiting a step of the intrinsic pathway of coagulation in an amount effective to inhibit thrombosis in the patient.

21. The method of claim 20, wherein the agent is an active site-

blocked Factor XII compound.

22. The method of claim 20, wherein the agent is an active site-blocked Factor XI compound.

23. An assay to determine the anticoagulant activity of a Factor IXa compound on a subject's blood which comprises:

(a) mixing Factor IX deficient plasma, diatomaceous earth and plasma containing the Factor IXa compound derived from the subject's blood;

(b) incubating the resulting mixture from step (a) with an effective dose of a source of phospholipid and calcium chloride under conditions such that clot formation results; and

(c) measuring the time necessary for clot formation in the incubate of step (b) so as to thereby determine the anticoagulant activity of the Factor IXa compound.

24. An assay of claim 23, further comprising comparing the time necessary for clot formation measured in step (c) with the time necessary for clot formation measured in the absence of the Factor IXa compound.

25. An assay of claim 23, wherein the subject is a human patient.

26. An assay of claim 23, wherein the Factor IXa compound is a functionally inactive form of Factor IXa.

27. An assay of claim 26, wherein the functionally inactive form of Factor IXa is a Factor IXa in which the active serine amino acid site has been altered.

28. A method for monitoring the anticoagulant activity of a Factor IXa compound which is being infused into the circulation of a subject's blood during surgery which comprises measuring the anticoagulant activity of the Factor IXa compound at different times during the surgery using the assay of claim 23 and comparing the activities so measured.
29. The method of claim 28, wherein the subject is a human patient.
30. The method of claim 28, wherein the surgery is cardiopulmonary by pass surgery.
31. The method of claim 28, wherein the Factor IXa compound is a functionally inactive form of Factor IXa.
32. The method of claim 31, wherein the functionally inactive form of Factor IXa is a Factor IXa in which the active serine amino acid site has been altered.
33. A method for inhibiting thrombosis in a human patient which comprises administering to the patient, or adding to blood which is to be administered to the patient, a Factor IXa compound in an amount which is effective to inhibit thrombosis but which does not significantly interfere with hemostasis in the patient.
34. A method of inhibiting clot formation in extracorporeal human blood which comprises adding to the blood an amount of a Factor IXa compound in an amount effective to inhibit clot formation but which does not significantly interfere with hemostasis when the blood is administered to a patient.
35. The method of claim 33 or 34, wherein the Factor IXa compound is a mutein.

36. The method of claim 35, wherein the mutein is an inactive recombinant Factor IXa.

5 37. The method of claim 35, wherein the mutein is a Factor IX having a Ser365 to Ala substitution or a Factor IXa having a Ser185 to Ala substitution.

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